19. (New) A method for treating a mycobacterial infection in a subject, the method comprising: administering to a subject an immunostimulatory nucleic acid molecule in an amount effective to treat or ameliorate an infection with a Mycobacterium bacterium, thereby treating the infection in the subject.

20. (New) The method of claim 19, wherein the immunostimulatory nucleic acid molecule is an immunostimulatory oligodeoxyribonucleotide.

21. (New) The method of claim 19, wherein the immunostimulatory nucleic acid molecule is purified bacterial DNA.

22. (New) The method of claim 19, wherein the immunostimulatory nucleic acid molecule is a plasmid DNA including sufficient immunostimulatory motifs to be immunostimulatory.

23. (New) The method of claim 19, wherein the immunostimulatory nucleic acid molecule is a plasmid DNA which after being administered to the subject is degraded into oligonucleotides.

24. (New) The method of claim 19, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif composed of an unmethylated CpG flanked by two 5′ purines and two 3′ pyrimidines.

25. (New) The method of claim 19, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif in which the CpG is flanked by a 5′ GpT dinucleotide and two 3′ pyrimidines.

26. (New) The method of claim 19, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif represented by:

$$5' X_1X_2CGX_3X_4\ 3'$$

wherein C and G are unmethylated, and X_1, X_2, X_3 and X_4 are nucleotides.

27. (New) The method of claim 19, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif represented by:

$$5' X_1X_2CGX_3X_4\ 3'$$

wherein C and G are unmethylated, X_1X_2 is selected from GpT, GpG, and GpA, and X_3 and X_4 are nucleotides.

28. (New) The method of claim 19, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif represented by:

$$5' X_1X_2CGX_3X_4\ 3'$$

wherein C and G are unmethylated, X_1 and X_2 are nucleotides, and X_3X_4 is selected from TpT, CpT, and GpT.

29. (New) The method of claim 19, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif represented by:

$$5' X_1X_2CGX_3X_4\ 3'$$

wherein C and G are unmethylated, X_1X_2 is selected from GpT, GpG, and GpA, and X_3X_4 is selected from TpT, CpT, and GpT.

30. (New) The method of claim 19, wherein the immunomodulatory nucleic acid molecule comprises a sequence selected from the group consisting of: AACGCC, AACGCT, AACGTC, AACGTT, AGCGCC, AGCGCT, AGCGTC, AGCGTT, GACGCC, GACGCT, GACGTC, GACGTT, GGCGCC, GGCGCT, GGCGTC, GGCGTT, ATCGCC, ATCGCT, ATCGTC, ATCGTT, GTCGCC, GTCGCT, GTCGTC, GTCGTT, and AACGCTCG.

31. (New) The method of claim 84, wherein the immunostimulatory nucleic acid molecule comprises the sequence AACGTT.

32. (New) The method of claim 19, wherein said administering boosts the subject's immune response to eliminate an infection with a species of *Mycobacteria*.

33. (New) The method of claim 19, wherein the bacterium is *Mycobacterium tuberculosis*.

34. (New) The method of claim 19, wherein the bacterium is *Mycobacterium avium*.

35. (New) The method of claim 19, wherein the subject has an immune system deficiency.

36. (New) The method of claim 35, wherein the subject's immune system is not functioning in a normal capacity.

37. (New) A method for stimulating in a subject an immune response against a Mycobacterium bacterium, the method comprising: administering to a subject an immunostimulatory nucleic acid molecule in an amount effective to stimulate an immune response in the subject, wherein said administering results in an immune response effective to treat, prevent or ameliorate an infection in the subject, wherein the infection is a bacterial infection with a Mycobacterium bacterium.

38. (New) The method of claim 90, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif composed of an unmethylated CpG flanked by two 5′ purines and two 3′ pyrimidines.

39. (New) The method of claim 90, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif in which the CpG is flanked by a 5′ GpT dinucleotide and two 3′ pyrimidines.

40. (New) The method of claim 90, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif represented by:

$$5' X_1X_2CGX_3X_4\ 3'$$

wherein C and G are unmethylated, and X_1, X_2, X_3 and X_4 are nucleotides.

41. (New) The method of claim 90, wherein the immunostimulatory nucleic acid

molecule comprises a CpG motif represented by:

$$5' X_1X_2CGX_3X_4\ 3'$$

wherein C and G are unmethylated, X_1X_2 is selected from GpT, GpG, and GpA, and X_3 and X_4 are nucleotides.

42. (New) The method of claim 90, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif represented by:

$$5' X_1X_2CGX_3X_4\ 3'$$

wherein C and G are unmethylated, X_1 and X_2 are nucleotides, and X_3X_4 is selected from TpT, CpT, and GpT.

43. (New) The method of claim 90, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif represented by:

$$5' X_1X_2CGX_3X_4\ 3'$$

wherein C and G are unmethylated, X_1X_2 is selected from GpT, GpG, and GpA, and X_3X_4 is selected from TpT, CpT, and GpT.

44. (New) The method of claim 90, wherein the immunostimulatory nucleic acid molecule comprises a sequence selected from the group consisting of: AACGCC, AACGCT, AACGTC, AACGTT, AGCGCC, AGCGCT, AGCGTC, AGCGTT, GACGCC, GACGCT, GACGTC, GACGTT, GGCGCC, GGCGCT, GGCGTC, GGCGTT, ATCGCC, ATCGCT, ATCGTC, ATCGTT, GTCGCC, GTCGCT, GTCGTC, GTCGTT, and AACGCTCG.

45. (New) The method of claim 44, wherein the immunostimulatory nucleic acid molecule comprises the sequence AACGTT.

46. (New) The method of claim 90, wherein the bacterium is *Mycobacterium tuberculosis.*

47. (New) The method of claim 90, wherein the bacterium is *Mycobacterium avium.*

48. (New) The method of claim 90, wherein the subject has an immune system deficiency.

49. (New) The method of claim 48, wherein the subject's immune system is not functioning in a normal capacity.

50. (New) A method for treating a mycobacterial infection in a subject, the method comprising: administering to a subject an immunostimulatory nucleic acid molecule in an amount effective to treat, prevent or ameliorate an infection in the subject, wherein the infection is a bacterial infection with a Mycobacterium bacterium, thereby treating the infection in the subject, wherein the immunostimulatory nucleic acid comprises an immunostimulatory sequence comprising an unmethylated cytosine, guanine dinucleotide sequence.

51. (New) The method of claim 50, wherein the immunostimulatory nucleic acid molecule is an immunostimulatory oligodeoxyribonucleotide.

52. (New) The method of claim 50, wherein the immunostimulatory nucleic acid molecule is purified bacterial DNA.

53. (New) The method of claim 50, wherein the immunostimulatory nucleic acid molecule is a plasmid DNA including sufficient immunostimulatory motifs to be immunostimulatory.

54. (New) The method of claim 50, wherein the immunostimulatory nucleic acid molecule is a plasmid DNA which after administration to the subject is degraded into oligonucleotides.

55. (New) The method of claim 50, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif composed of an unmethylated CpG flanked by two 5′ purines and two 3′ pyrimidines.

56. (New) The method of claim 50, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif in which the CpG is flanked by a 5′ GpT dinucleotide and two 3′ pyrimidines.

57. (New) The method of claim 50, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif represented by:

$$5' X_1X_2CGX_3X_4\ 3'$$

wherein C and G are unmethylated, and X_1, X_2, X_3 and X_4 are nucleotides.

58. (New) The method of claim 50, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif represented by:

$$5' X_1X_2CGX_3X_4\ 3'$$

wherein C and G are unmethylated, X_1X_2 is selected from GpT, GpG, and GpA, and X_3 and X_4 are nucleotides.

59. (New) The method of claim 50, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif represented by:

$$5' X_1X_2CGX_3X_4\ 3'$$

wherein C and G are unmethylated, X_1 and X_2 are nucleotides, and X_3X_4 is selected from TpT, CpT, and GpT.

60. (New) The method of claim 50, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif represented by:

$$5' X_1X_2CGX_3X_4\ 3'$$

wherein C and G are unmethylated, X_1X_2 is selected from GpT, GpG, and GpA, and X_3X_4 is selected from TpT, CpT, and GpT.

61. (New) The method of claim 50, wherein the immunostimulatory nucleic acid molecule comprises a sequence selected from the group consisting of: AACGCC, AACGCT, AACGTC, AACGTT, AGCGCC, AGCGCT, AGCGTC, AGCGTT, GACGCC, GACGCT, GACGTC, GACGTT, GGCGCC, GGCGCT, GGCGTC,

GGCGTT, ATCGCC, ATCGCT, ATCGTC, ATCGTT, GTCGCC, GTCGCT, GTCGTC, GTCGTT, and AACGCTCG.

62. (New) The method of claim 61, wherein the immunostimulatory nucleic acid molecule comprises the sequence AACGTT.

63. (New) The method of claim 50, wherein said administering boosts the subject's immune response to eliminate an infection with a species of *Mycobacteria*.

64. (New) The method of claim 50, wherein the bacterium is *Mycobacterium tuberculosis*.

65. (New) The method of claim 50, wherein the bacterium is *Mycobacterium avium*.

66. (New) The method of claim 50, wherein the subject has an immune system deficiency.

67. (New) The method of claim 66, wherein the subject's immune system is not functioning in a normal capacity.

68. (New) A method for stimulating in a subject an immune response against a Mycobacterium bacterium, the method comprising: administering to a subject an immunostimulatory nucleic acid molecule in an amount effective to stimulate an immune response in the subject, wherein the immunostimulatory nucleic acid comprises an immunostimulatory sequence comprising an unmethylated cytosine, guanine dinucleotide sequence, wherein said administering results in an immune response effective to treat, prevent or ameliorate an infection in the subject, wherein the infection is a bacterial infection with a Mycobacterium bacterium.

69. (New) The method of claim 68, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif composed of an unmethylated CpG flanked by two 5′ purines and two 3′ pyrimidines.

70. (New) The method of claim 68, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif in which the CpG is flanked by a 5′ GpT dinucleotide and two 3′ pyrimidines.

71. (New) The method of claim 68, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif represented by:

$$5' X_1X_2CGX_3X_4\ 3'$$

wherein C and G are unmethylated, and X_1, X_2, X_3 and X_4 are nucleotides.

72. (New) The method of claim 68, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif represented by:

$$5' X_1X_2CGX_3X_4\ 3'$$

wherein C and G are unmethylated, X_1X_2 is selected from GpT, GpG, and GpA, and X_3 and X_4 are nucleotides.

73. (New) The method of claim 68, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif represented by:

$$5' X_1X_2CGX_3X_4\ 3'$$

wherein C and G are unmethylated, X_1 and X_2 are nucleotides, and X_3X_4 is selected from TpT, CpT, and GpT.

74. (New) The method of claim 68, wherein the immunostimulatory nucleic acid molecule comprises a CpG motif represented by:

$$5' X_1X_2CGX_3X_4\ 3'$$

wherein C and G are unmethylated, X_1X_2 is selected from GpT, GpG, and GpA, and X_3X_4 is selected from TpT, CpT, and GpT.

75. (New) The method of claim 68, wherein the immunostimulatory nucleic acid molecule comprises a sequence selected from the group consisting of: AACGCC, AACGCT, AACGTC, AACGTT, AGCGCC, AGCGCT, AGCGTC, AGCGTT, GACGCC, GACGCT, GACGTC, GACGTT, GGCGCC, GGCGCT, GGCGTC,

GGCGTT, ATCGCC, ATCGCT, ATCGTC, ATCGTT, GTCGCC, GTCGCT, GTCGTC, GTCGTT, and AACGCTCG.

76. (New) The method of claim 75, wherein the immunostimulatory nucleic acid molecule comprises the sequence AACGTT.

77. (New) The method of claim 68, wherein the bacterium is *Mycobacterium tuberculosis*.

78. (New) The method of claim 68, wherein the bacterium is *Mycobacterium avium*.

79. (New) The method of claim 68, wherein the subject has an immune system deficiency.

80. (New) The method of claim 79, wherein the subject's immune system is not functioning in a normal capacity.

81. (New) A method for treating a mycobacterial infection in a subject, the method comprising: administering to a subject an immunomodulatory nucleic acid molecule in an amount effective to inhibit replication of a Mycobacterium bacterium, thereby treating mycobacterial infection in the subject.

82. (New) The method of claim 81, wherein the immunomodulatory nucleic acid molecule is selected from the group consisting of an immunostimulatory oligodeoxyribonucleotide (ISS-ODN); an isolated, detoxified bacterial polynucleotide; and an ISS-enriched plasmid DNA.

83. (New) The method of claim 81, wherein the immunomodulatory nucleic acid molecule comprises a CpG motif selected from the group consisting of:

a) 5′-Purine-Purine-[C]-[G]-Pyrimidine-Pyrimidine-3′;

b) 5′-Purine-TCG-Pyrimidine-Pyrimidine-3′;

c) 5′-$[TCG]_n$-3′, where n is any integer that is at least 1; and

d) 5'-Purine-Purine-CG-Pyrimidine-Pyrimidine-CG-3'.

84. (New) The method of claim 81, wherein the immunomodulatory nucleic acid molecule comprises a sequence selected from the group consisting of: AACGCC, AACGCT, AACGTC, AACGTT, AGCGCC, AGCGCT, AGCGTC, AGCGTT, GACGCC, GACGCT, GACGTC, GACGTT, GGCGCC, GGCGCT, GGCGTC, GGCGTT, ATCGCC, ATCGCT, ATCGTC, ATCGTT, GTCGCC, GTCGCT, GTCGTC, GTCGTT, and AACGCTCG.

85. (New) The method of claim 84, wherein the immunomodulatory nucleic acid molecule comprises the sequence AACGTT.

86. (New) The method of claim 81, wherein said administering results in induction of an immune response effective against infection by a mycobacterial pathogen.

87. (New) The method of claim 81, wherein the bacterium is *Mycobacterium tuberculosis*.

88. (New) The method of claim 81, wherein the bacterium is *Mycobacterium avium*.

89. (New) The method of claim 81, wherein the subject is immunocompromised.

90. (New) A method for inducing in a subject an immune response against a Mycobacterium bacterium, the method comprising: administering to a subject an amount of an immunomodulatory nucleic acid molecule in an amount effective to elicit an immune response against a Mycobacterium bacterium; wherein said administering results in induction of an immune response effective to protect the subject against onset of disease or to decrease severity of symptoms of disease caused by infection by the Mycobacterium bacterium.

91. (New) The method of claim 90, wherein the immunomodulatory nucleic acid molecule comprises a CpG motif selected from the group consisting of:

a) 5′-Purine-Purine-[C]-[G]-Pyrimidine-Pyrimidine-3′;

b) 5′-Purine-TCG-Pyrimidine-Pyrimidine-3′;

c) 5′-$[TCG]_n$-3′, where n is any integer that is at least 1; and

d) 5′-Purine-Purine-CG-Pyrimidine-Pyrimidine-CG-3′.

92. (New) The method of claim 90, wherein the immunomodulatory nucleic acid molecule comprises a sequence selected from the group consisting of: AACGCC, AACGCT, AACGTC, AACGTT, AGCGCC, AGCGCT, AGCGTC, AGCGTT, GACGCC, GACGCT, GACGTC, GACGTT, GGCGCC, GGCGCT, GGCGTC, GGCGTT, ATCGCC, ATCGCT, ATCGTC, ATCGTT, GTCGCC, GTCGCT, GTCGTC, GTCGTT, and AACGCTCG.

93. (New) The method of claim 92, wherein the immunomodulatory nucleic acid molecule comprises the sequence AACGTT.

94. (New) The method of claim 90, wherein the bacterium is *Mycobacterium tuberculosis.*

95. (New) The method of claim 90, wherein the bacterium is *Mycobacterium avium.*

96. (New) The method of claim 90, wherein the subject is immunocompromised.

97. (New) A method for treating a mycobacterial infection in a subject, the method comprising: administering to a subject multiple doses of an immunomodulatory nucleic acid molecule in an amount effective to inhibit replication of a Mycobacterium bacterium, thereby treating the mycobacterial infection in the subject, wherein the immunomodulatory nucleic acid comprises an immunostimulatory sequence comprising 5' CpG 3'.

98. (New) The method of claim 97, wherein the immunomodulatory nucleic acid molecule is selected from the group consisting of an immunostimulatory

oligodeoxyribonucleotide (ISS-ODN); an isolated, detoxified bacterial polynucleotide; and an ISS-enriched plasmid DNA.

99. (New) The method of claim 97, wherein the immunomodulatory nucleic acid molecule comprises a CpG motif selected from the group consisting of:

5′-Purine-Purine-C-G-Pyrimidine-Pyrimidine-3′;

5′-Purine-TCG-Pyrimidine-Pyrimidine-3′;

5′-$(TCG)_n$-3′, where n is any integer that is at least 1; and

5′-Purine-Purine-CG-Pyrimidine-Pyrimidine-CG-3′.

100. (New) The method of claim 97, wherein the immunomodulatory nucleic acid molecule comprises a sequence selected from the group consisting of: AACGCC, AACGCT, AACGTC, AACGTT, AGCGCC, AGCGCT, AGCGTC, AGCGTT, GACGCC, GACGCT, GACGTC, GACGTT, GGCGCC, GGCGCT, GGCGTC, GGCGTT, ATCGCC, ATCGCT, ATCGTC, ATCGTT, GTCGCC, GTCGCT, GTCGTC, GTCGTT, and AACGCTCG.

101. (New) The method of claim 100, wherein the immunomodulatory nucleic acid molecule comprises the sequence AACGTT.

102. (New) The method of claim 97, wherein said administering results in induction of an immune response effective against infection by a mycobacterial pathogen.

103. (New) The method of claim 97, wherein the bacterium is *Mycobacterium tuberculosis*.

104. (New) The method of claim 97, wherein the bacterium is *Mycobacterium avium*.

105. (New) The method of claim 97, wherein the subject is immunocompromised.

106. (New) A method for inducing in a subject an immune response against a Mycobacterium bacterium, the method comprising: administering to a subject multiple

doses of an immunomodulatory nucleic acid molecule in an amount effective to elicit an immune response against a Mycobacterium bacterium, wherein the immunomodulatory nucleic acid comprises an immunostimulatory sequence comprising 5' CpG 3';

wherein said administering results in induction of an immune response effective to protect the subject against onset of disease or to decrease severity of symptoms of disease caused by infection by the Mycobacterium bacterium.

107. (New) The method of claim 106, wherein the immunomodulatory nucleic acid molecule comprises a CpG motif selected from the group consisting of:

5′-Purine-Purine-C-G-Pyrimidine-Pyrimidine-3′;

5′-Purine-TCG-Pyrimidine-Pyrimidine-3′;

5′-$(TCG)_n$-3′, where n is any integer that is at least 1; and

5′-Purine-Purine-CG-Pyrimidine-Pyrimidine-CG-3′.

108. (New) The method of claim 106, wherein the immunomodulatory nucleic acid molecule comprises a sequence selected from the group consisting of: AACGCC, AACGCT, AACGTC, AACGTT, AGCGCC, AGCGCT, AGCGTC, AGCGTT, GACGCC, GACGCT, GACGTC, GACGTT, GGCGCC, GGCGCT, GGCGTC, GGCGTT, ATCGCC, ATCGCT, ATCGTC, ATCGTT, GTCGCC, GTCGCT, GTCGTC, GTCGTT, and AACGCTCG.

109. (New) The method of claim 108, wherein the immunomodulatory nucleic acid molecule comprises the sequence AACGTT.

110. (New) The method of claim 106, wherein the bacterium is *Mycobacterium tuberculosis*.

111. (New) The method of claim 106, wherein the bacterium is *Mycobacterium avium*.

112. (New) The method of claim 106, wherein the subject is immunocompromised.